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B. Tech
PEMN 6412

Eighth Semester Examination – 2008

ADVANCED SAFETY ENGINEERING

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory
and any **five** from the rest.

The figures in the right-hand margin
indicate marks.



1. Answer the following questions in brief :

2×10

- (i) Write down five major causes of accidents in underground coal mines of our country in the last decade.
- (ii) What is severity rate of mine accidents ? How is it calculated ?

- (iii) Why statistical analysis of mine accidents carried out ?
 - (iv) Give examples of a few unsafe acts that could lead to accidents due to the use of explosives.
 - (v) What is job safety analysis ?
 - (vi) What is MAP ?
 - (vii) What are the different mediums of promoting safety in mines ?
 - (viii) What is safety audit ?
 - (ix) What causes an air blast ?
 - (x) State the causes and symptoms of miner's anemia.
2. (a) How are accidents classified for the purpose of reporting in our country ? 4
- (b) In a particular mining industry the total employment is 4600 and the annual production is 36 MT. From analysis of accident statistics it is observed that 5 persons

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get killed every year, 18 persons are seriously injured and 45 persons suffer from minor accidents. Calculate the death rate, serious injury rate and the severity index . 6

3. (a) What is the purpose of carrying out investigations of accidents ? 4
- (b) What is the major cause of fatal and serious accidents in the coal and metal mines of our country ? What are the possible reasons for the same ? What measures will you suggest to bring down the rate of accidents due to the above reason ? 6
4. Outline the step by step procedure that should be followed during an accident investigation. 10
5. Using the standard format, write a report of investigation due to roof fall in a mining district where two persons have been killed. Assume your own conditions. 10

6. (a) What is ZAP ? Is it achievable in case of underground coal mines of our country ? Give proper justification to your answer. 5
- (b) What are the direct and indirect costs of accidents in mines ? 5
7. (a) How can safety training be imparted to miners ? 5
- (b) Explain the mechanism of coal outburst in mines. What measures are required to be adopted to prevent its occurrence ? 5
8. Write the symptoms, causes and remedial measures to be adopted for the following diseases : 5×2
- (i) Silicosis
- (ii) Manganese poisoning.

